



Acceptable Large POWTS for Nitrogen Removal

Large “Private Onsite Wastewater Treatment Systems” (POWTS) are required to obtain a Wisconsin Pollutant Discharge Elimination System (WPDES) operating permit from the WDNR. The WDNR can either issue an individual permit that is written with specific requirements (including monitoring) for a specific facility or it can issue a “general” permit that has been developed for large POWTS (Permit No. WI0062901). To be eligible for the general permit the proposed POWTS must employ a treatment process that the Department determines will reliably remove nitrogen. The general permit does not contain water sampling monitoring requirements.

This document identifies wastewater treatment systems or designs that the WDNR has previously determined are acceptable for nitrogen removal and thus may qualify for the general permit. The proposed treatment system is an important consideration in the Department’s decision process for determining if a general permit can be issued, but it is not the only consideration. The Department will evaluate project circumstances in a comprehensive manner and may issue an individual (specific) permit, regardless of the type of treatment process, if it is determined necessary to ensure protection of groundwater quality or water supplies.

The list was not established based on a complete review of all available technologies. It is expected that other types of treatment systems may be acceptable and designers may propose these technologies with supporting information for nitrogen removal claims. When evaluating proposed systems for nitrogen removal the Department normally uses the general criterion that the system must be able to consistently remove at least 65% total nitrogen, assuming the system receives typical domestic quality wastewater. In assessing proposed technologies with regard to qualifying for the general permit, the Department would expect performance claims to be substantiated by performance data (preferably conducted by an independent party) for actual field installations similar to what may be encountered in Wisconsin. For systems or designs that may logically be expected to sufficiently remove nitrogen, but lack adequate supporting data, the Department may accept the treatment system, but with the issuance of an individual WPDES permit containing monitoring requirements designed to verify performance results.

The inclusion of any particular system in this list is not meant to imply an assurance of performance or any sort of product endorsement by the DNR for any purpose other than qualifying for the general WPDES permit. The systems are listed alphabetically by the system manufacturer (or product) name and no preference for any one particular system is intended.

Some of these systems or designs have been approved by the Department of Commerce under their Plumbing Product Register program or by the approval of “Component Manuals”. These products have been recognized as providing substantial nitrogen removal when designed, installed, and operated according to the manufacturer’s requirements and the stipulations of the Commerce approvals. Some of these products may be approved by Commerce for certain maximum design flows, which may be less than 12,000 gallons per day. It is generally expected that design principles accepted for nitrogen removal in smaller systems could also be accepted by DNR in larger models employing the same design principles.

Additional information on the Department of Commerce approved products, design component manuals, and approvals stipulations is available from their Internet web site at:

<http://www.commerce.state.wi.us/SB/SB-PowtsProgram.html>

Acceptable Large POWTS Designs or Systems for Nitrogen Removal:

Manufacturer's Name and Product Identification	Comments / Conditions																																																		
BioClere™ (16 series model) Aerobic Treatment Unit system	Designed to produce effluent with total nitrogen range of 10 to 15 mg/l.																																																		
Bio-Microbics® FAST system model	Designed with a 70% total nitrogen removal capability																																																		
EHS-Environmental/Health Products & Service - Moving Bed Biofilm Reactor System	<p>Must be designed in accordance with the Commerce "MOVING BED BIOFILM REACTOR SYSTEM COMPONENT MANUAL; EHS-REVISION 1: APRIL"</p> <p>This product is subject to Commerce approval stipulations 1235 and 1322 and is acceptable only if designed to achieve 10 mg/l total nitrogen as indicated in the following stipulation statement.</p> <p>Stipulation 1322 – "Approval of this POWTS Component Manual is for recognition for designs of systems that are covered by this manual. Systems that are designed, installed and maintained in accordance with this manual will produce effluent having equal to or less than 25 mg/L BOD5, 30 mg/L TSS and 8-20 mg/L nitrite+nitrate-nitrogen and 10-30 mg/L of Total N. Systems using this method of treatment can also be designed to achieve less than 10 mg/L Total Nitrogen if properly designed and maintained."</p>																																																		
Orenco Systems Inc. - Advantex-Treatent System AX SERIES AX20-Mode 3, Blend Discharge, and AX20-Mode 3, Filtrate Discharge AX10-Mode 3, Blend Discharge, and AX10-Mode 3, Filtrate Discharge	<p>This product is subject to Commerce product approval stipulations 311, 1223, and 1244. The Mode 1 design as described in the following stipulation 1223 is not acceptable. The Mode 3 system must be used.</p> <p><u>Stipulation 1223</u> – "Based on testing data submitted and reviewed by the department, this approval recognizes that this plumbing product will produce effluent with monthly average values as indicated in Table 1 when the influent has average monthly values for BOD5 of 150 mg/L, TSS of 40mg/L, TN 65 mg/L and FOG of 20 mg/L.</p> <p>Table 1 Effluent Strength from Treatment System</p> <table><tr><td>Mode</td><td>BOD5</td><td>TSS</td><td>TN</td><td>Fecal</td></tr><tr><td>Coliform</td><td>(mg/L)</td><td>(mg/L)</td><td>(mg/L)</td><td>(cfu/100 ml)</td></tr><tr><td>Mode 1</td><td></td><td></td><td></td><td></td></tr><tr><td>Blend Discharge</td><td>20</td><td>20</td><td>30</td><td>>10,000</td></tr><tr><td>Mode 1</td><td></td><td></td><td></td><td></td></tr><tr><td>Filtrate Discharge</td><td>15</td><td>15</td><td>25</td><td><1000</td></tr><tr><td>Mode 3</td><td></td><td></td><td></td><td></td></tr><tr><td>Blend Discharge</td><td>30</td><td>20</td><td>15</td><td>>10,000</td></tr><tr><td>Mode 3</td><td></td><td></td><td></td><td></td></tr><tr><td>Filtrate Discharge</td><td>15</td><td>15</td><td>10</td><td><1000"</td></tr></table>	Mode	BOD5	TSS	TN	Fecal	Coliform	(mg/L)	(mg/L)	(mg/L)	(cfu/100 ml)	Mode 1					Blend Discharge	20	20	30	>10,000	Mode 1					Filtrate Discharge	15	15	25	<1000	Mode 3					Blend Discharge	30	20	15	>10,000	Mode 3					Filtrate Discharge	15	15	10	<1000"
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Split Bed Recirculating Sand Filter	Must be designed for nitrogen removal as described in the DComm Component Manual entitled "Split Bed Recirculating Sand Filter System".